ABSTRACT

Various embodiments of a computer-implemented branch-free methodology for approximating a function of an input argument are disclosed. The methodology includes selecting one of a number of breakpoints, such that a reduced argument for the function is less than a predetermined value. An approximate function of the reduced argument is evaluated, including accessing a look-up table based on the selected breakpoint to obtain value of a term in the approximate function. The look-up table has at least one breakpoint for which the reduced argument can be computed without roundoff error when the input argument is close to a root of the function. The branch-free methodology may be applied to compute transcendental functions such as the exponential, logarithm, and trigonometric functions.